

# Nokia Siemens Networks Flexi Base Station Controller (Flexi BSC)

## Peerless capacity, scalability, and efficiency in a single cabinet

Nokia Siemens  
Networks



GSM is booming with steadily growing subscriber numbers, networks, and data traffic. Aiming to capitalizing on this business opportunity, Communications Service Providers (CSPs) are looking for the best GSM investment.

One network provider rises to the challenge with innovative solutions, advanced features, and enhanced capabilities – Nokia Siemens Networks. Our solutioneers chart a smooth evolutionary course to protect operators' installed base and future-proof their investments. And they develop new products geared to drive revenues up and costs down. Witness our Flexi BSC: Engineered to provide remarkable capacity, it leaves a small footprint and consumes little power.

### **Bigger capacity, smaller package**

The latest Nokia Siemens Networks Base Station Controller, the Flexi BSC, offers vastly improved capacity in a compact package the size of a single cabinet. If you are seeking to boost capacity and improve your network with the latest technology, look no further than the Flexi BSC.

It delivers plenty of capacity to meet even the most demanding requirements. Featuring the latest Intel processors, it rivals any other BSC for CS traffic capacity and outperforms them all in terms of PS traffic handling capacity.

### **All but unlimited traffic handling**

The Flexi BSC scales to suit just about any size demand, so its PS traffic handling capacity is practically unlimited. No need to buy new BSCs when this one grows in step with your business. Market leading CS traffic handling capacity with 25,000 erlangs takes care of the solid base of revenue coming from call traffic.



## Built to trim OPEX

Far more capacity from one box means far less equipment to install and operate. Its compact format saves site space and costs, and the easily connected interfaces expedite installation to cut IMPEX.

OPEX savings figure prominently in the Flexi BSC. For one, its advanced technology and compact, single-cabinet design minimize power consumption. Figures below 1 W per TRX attest to its remarkable efficiency.

## Easy to extend

Accommodating up to 4,200 TRXs in one cabinet, its capacity scales in one TRX steps. You can start low and pay as you grow, adding Packet Control Units as demand dictates. Measured in erlangs or Mbit/s, traffic handling costs have never been so low. And adding more capacity to your installed base has never been easier.

The Flexi BSC's peak processing capacity is over 25,000 erlangs with our nominal call mix, and it supports up to 4,200 BTS sectors. This means you can use all 4,200 TRXs to their full extent to capitalize fully on your investment.

With so many transceivers to work with, you can make handovers more efficient and reduce signaling overhead between the mobile switches (MSS) and BSC to save installation, commissioning, spare parts, operating, and maintenance costs. And because this unit is so easy to extend, you can add on improved functionality without having to adapt the system architecture.

## Effortless updating

What's more, the Flexi BSC's modular structure lets you increase traffic handling capacity by updating its processors as faster Intel products become available. The latest step up the evolutionary ladder to higher TRX capacity from 3,000 to 4,200 TRXs is an excellent example of the continuous evolution of Intel processing solutions. Another aspect of the future-proof Flexi BSC is its flexible architecture, which enables the Multicontroller BSC to be used as a capacity extension for the Flexi BSC.

This option will open new evolution possibilities for the installed base to evolve towards 3G. Additionally, new transmission options are introduced in the form of plug-in units to make integrated solutions updateable as smoothly as possible. Whether it is capacity, functional evolution or transmission, the Flexi BSC is here to serve for years to come with easy updates.

## Less to install and maintain

Equipped with an IP switch, the Flexi BSC offers flexible connectivity options, brings IP capability to all external interfaces such as Packet Abis and A over IP, and enables high capacity SIGTRAN (SS7 over IP) links to maximize traffic usage.

The Flexi BSC comes complete with built-in SDH/Sonet capability as well as conventional PCM interfaces. With the benefit of this optical interface, you need fewer connections, which translates to less installation effort, faster rollout, and lower maintenance costs. External transmission equipment is unnecessary, so there are far fewer network elements to support.

## Rugged and reliable

Software releases, new radio network parameters, and configuration changes may be downloaded to the BSC and to base stations (BTSs) from the central NetAct™ Operations Support System without interrupting network traffic. Automatic fault detection and redundant hot standby units minimize downtime. Even if a call control or switching unit develops a fault, very few calls and connections are lost. And sophisticated overload protection mechanisms ascertain traffic handling capacity under extreme conditions.

## Unmatched availability

Reliability and high availability have always been key assets of Nokia Siemens Networks BSCs. The Flexi BSC carries on the tradition with a 0.9999998 availability rating, a figure that makes it the market leader.

The ultra advanced NetAct™ Operations Support System provides integrated network management and automated management processes to drive OPEX down even further. It also leverages centralized tools for networkwide operations and enables more proactive responses to network events to help boost revenue. And it helps optimize CAPEX by providing a steady stream of information, enabling managers to make informed business decisions.

## Advanced software for superior performance

Courtesy of its sophisticated software, the Flexi BSC can accommodate any mix of CS and PS traffic to maximize capacity. It puts into your hands advanced software tools that let you "squeeze" utmost capacity and efficiency from the radio spectrum and resolve congestion in urban networks.

Our solutioneers know that software is the most cost-effective way of boosting network reliability and capacity. This is why our commitment to our BSC software's evolutionary advance runs deep. Count on us to keep coming up with improvements that benefit you.

The latest in radio network performance software is the unique Nokia Siemens Networks innovation called Orthogonal Sub Channel (OSC). OSC introduces a doubling of the channel capacity; that is, four users sharing the same radio slot via a Double Half Rate (DHR) channel, made possible through unique innovation by Nokia Siemens Networks. When an operator needs to increase capacity, this is normally achieved through extending the BTS configuration (via increasing the TRX and combiner port count), increasing the combining loss, and potentially impacting coverage. OSC can provide this increased capacity without requiring new TRXs (or related hardware) and avoiding the network impact. Consequently, for the operator an increased capacity can be provided more easily and effectively. Due to the capacity improvements realized by OSC, fewer TRXs are necessary in order to realize a specific capacity or spectral efficiency.

## Ready for WCDMA and LTE

Another key feature of the Flexi BSC is its ability to interwork with WCDMA. It enables handovers from GSM BSS to WCDMA RAN and vice versa, and supports both CS (handover and MS cell re-selection) and PS (MS cell re-selection) modes. No other platform is better suited for building GSM/WCDMA networks and providing seamless services to users.

GSM/EDGE-LTE interworking is gaining currency, and service continuity for multimode operations will soon be a big issue. The Flexi BSC is ready to tackle the LTE challenge. On top of functional interworking, the co-location of Flexi BSC with Multicontroller BSC also brings the product evolution path towards the Multicontroller RNC.

## Tops in transmission efficiency

Nokia Siemens Networks BSCs act as BTS controllers and as remote voice and data concentrators, thereby cutting the cost of leased transmission lines. Whether the need is for traditional PCM, optical STM-1/OC-3 or IP/Ethernet, the Flexi BSC will provide integrated solutions for the most cost-efficient option.

## Concentrated to cut costs

Our BSCs install at remote locations, reducing the number of transmission links back to the MSS. The BSC concentrates traffic as close to the air interface as possible – that is; near the BTSs where traffic is generated – to save transmission costs.

Siting the PCU as an integral part of the BSC also helps concentrate PS traffic and spares you the expense of distributing data to a remote location.

## Key features at a glance

- High circuit and packet handling capacity, from 4,200 TRXs in a compact, single-cabinet format
- Low power consumption
- Full flexibility in BTS configurations with unlimited number of sectors and sites
- Modular for easy expansion and evolution
- Built-in IP and SDH/Sonet connectivity
- Supports SIGTRAN (SS7 over IP)
- Very efficient use of radio resources with flexible voice and data traffic mix
- Highest radio network efficiency with innovative features such as OSC
- BSC and MSC may be sited apart to boost transmission efficiency
- Field-proven reliability, advanced architecture, and superior flexibility
- Swift fault detection and hot standby units for minimal downtime
- Powerful handover and power control algorithms for high call success rate
- Full support of the market leading NetAct™ network management system
- GSM-WCDMA interworking
- Co-location option with Multicontroller BSC
- GSM-LTE interworking

### Technical specification of Flexi BSC

Capacity	Maximum capacity: 4,200 TRXs Capacity increase in 1-TRX steps Maximum connectivity: 4,200 BTS cells 800 E1/T1 external PCM interfaces Up to 18 STM-1/OC-3 optical external interfaces with redundancy options Up to 14 Gigabit Ethernet external interfaces for IP with redundancy options
Performance	Voice: 25,200 erlangs Data: 30,720 (E)GPRS 16 kbit/s channels
Weights	Flexi BSC fully loaded (one cabinet) approx. 350 kg Floor loading below 500 kg/m <sup>2</sup> No need for raised floor
Cabinet dimensions Height x width x depth (mm)	2000 x 900 x 600 mm
Power supply	Inputs -48 or -60 V dc Direct floating batteries can be used in both cases
Power consumption	Nominal power consumption: 3.0 kW Typical operating power consumption of 4,200 TRX Flexi BSC is around 4 kW with average number of Packet Control Units and external interface units in use
Environment: Safety Fire resistance Earthquake resistance Environmental requirements EMC specifications Acoustic noise Restriction of Hazardous Substances Product collection and disposal	EN 60950 and UL 60950 GR63CORE & TP76200MP ETS 300 019 & GR63CORE ETS 300019-1-3 EN 300386-2 & FCC part 15 ETS 300 753 & GR63CORE EU 2002/95/EC (RoHS) EU 2002/96/EC (WEEE)

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